

IN THE CLAIMS:

Please amend the claims as follows:

1. (Original) A control apparatus for numerical control in a cutting machine having a turret to be rotated to arbitrary positions, said control apparatus comprising:

means for inputting cutting edge data (m, n) indicating a position of a cutting edge of a cutting tool;
means for inputting turret angle data (α) indicating an extent of rotation of said turret;
means for reading reference offset values (X0, Z0) corresponding to a length from said cutting edge to a turret axis (B);
means for obtaining offset data (X α , Z α) from said reference offset values (X0, Z0) and said turret angle data (α);
means for adding said cutting edge data (m, n) to said offset data (X α , Z α) to obtain turret axis data (ΔX , ΔZ); and
means for moving said turret on the basis of said turret axis data (ΔX , ΔZ) to perform a cutting.

2. (Currently Amended) A control apparatus according to claim 1, wherein a set ($X_{\alpha i}$, $Z_{\alpha i}$) of said offset data ($X_{\alpha[i]}$, $Z_{\alpha[i]}$) corresponding to a position of said cutting edge is calculated from said reference offset values (X0, Z0) and the corresponding turret angle data (αi) on the basis of the following equations 1 and 2.

$$X_{\alpha i} = Z0 \cdot \cos \alpha i - X0 \cdot \sin \alpha i \quad (\text{equation 1})$$

$$Z_{\alpha i} = Z0 \cdot \sin \alpha i + X0 \cdot \cos \alpha i \quad (\text{equation 2})$$

3. (Original) A control apparatus according to claim 2, wherein a set of said turret axis data (ΔX_i , ΔZ_i) corresponding to a position of said cutting edge is calculated from the corresponding offset data ($X_{\alpha i}$, $Z_{\alpha i}$) and the corresponding cutting edge data (m_i , n_i) on the basis of the following equations 3 and 4.

$$\Delta X_i = m_i + X_{\alpha i} \quad (\text{equation 3})$$

$$\Delta Z_i = n_i + Z_{\alpha i} \quad (\text{equation 4})$$

4. (Original) A cutting machine including the control apparatus according to any of claims 1 through 3.

5. (Original) A cutting method employing a cutting machine having a turret to be rotated to arbitrary positions, comprising the steps of;

inputting cutting edge data (m , n) and turret angle data α ;
reading reference offset values (X_0 , Z_0);
calculating offset data (X_α , Z_α) from said turret angle data (α) and said reference offset values (X_0 , Z_0);
calculating turret axis data (ΔX , ΔZ) from said offset data (X_α , Z_α) and said cutting edge data (m , n); and
performing a cutting on the basis of said turret axis data (ΔX , ΔZ).

6. (Currently Amended) A cutting method according to claim 5, wherein a set ($X_{\alpha i}$, $Z_{\alpha i}$) of said offset data ($X_{\alpha[i]}$, $Z_{\alpha[i]}$) corresponding to a position of said cutting edge is calculated from said reference offset values (X_0 , Z_0) and the corresponding turret angle data (α_i) on the basis of the following equations 1 and 2.

$$X_{\alpha i} = Z_0 \cdot \cos \alpha_i - X_0 \cdot \sin \alpha_i \quad (\text{equation 1})$$

$$Z_{\alpha i} = Z_0 \cdot \sin \alpha_i + X_0 \cdot \cos \alpha_i \quad (\text{equation 2})$$

7. (Original) A cutting method according to claim 6, wherein a set of said turret axis data (ΔX_i , ΔZ_i) corresponding to a position of said cutting edge is calculated from the corresponding offset data ($X_{\alpha i}$, $Z_{\alpha i}$) and the corresponding cutting edge data (m_i , n_i) on the basis of the following equations 3 and 4.

$$\Delta X_i = m_i + X_{\alpha i} \quad (\text{equation 3})$$

$$\Delta Z_i = n_i + Z_{\alpha i} \quad (\text{equation 4})$$